

REMARKS

This is in response to the Office Action of September 4, 2009. Claims 7-10 are cancelled, without prejudice, and replaced by new claims 16-19. New claim 20 is added, based upon such disclosure as that in the 1st full paragraph on page 9 and the 4th full paragraph on page 17 of the specification. New claim 21 is added, based upon such disclosure as that in the paragraph bridging pages 15-16 and the 3rd full paragraph on page 18 of the specification and Examples 1-3. No new matter is introduced by this Amendment. Claims 1-3 and 11-21 are now in the application, of which claims 1, 2, 11, and 13 stand withdrawn from consideration.

Claim objections

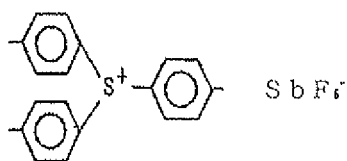
On page 3 of the Office Action, objection was raised to claims 7-10. It is respectfully submitted that replacement claims 16-19 are not subject to the objection stated by the Examiner.

Issues under 35 U.S.C. § 102

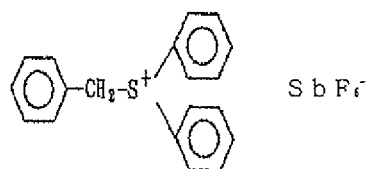
On pages 3-4 of the Office Action, claims 3, 7-10, 12, 14, and 15 were rejected as being anticipated by WO 01/95030 A2 (Yamamura) as evidenced by US 5,773,194 (Hattori) and US 5,336,574 (Igarashi). The rejection is respectfully traversed.

The Examiner contends that Yamamura exemplifies compositions in his Comparative Examples 3 and 5 comprising bis(3,4-epoxycycloheptylmethyl)adipate, a cationic photopolymerization initiator, and a surfactant. However, Yamamura discloses a photo-curable resin composition which includes the cationic photopolymerization initiator (UVI-6974) that generates cation species only by photo energy, **not by heat energy**. In contrast, the claimed heat-curable resin composition includes the cationic polymerization initiator which generates cationic species by heat energy.

The structure of SI-100L which is a thermal polymerization initiator used in the Examples of the present application and the structure of UVI-6974 which is a photopolymerization initiator used in the Examples of Yamamura are significantly different, as shown in the following figures. SI-100L has a methylene group and has thermal activity owing to this methylene group.



UVI-6974



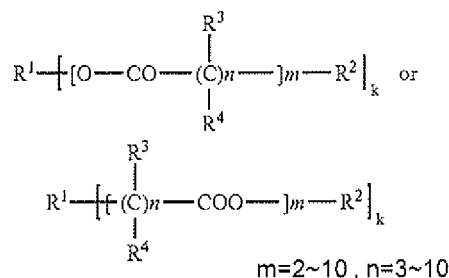
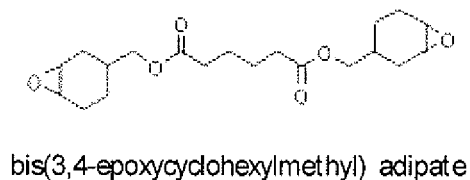
SI 100L

As stated above, the constituent of heat-curable resin composition of Applicant's independent claim 3 is quite different from the constituent of photo-curable resin composition of Yamamura. Therefore it is clear that claim 3 is novel with respect to the Yamamura disclosure.

In the paragraph bridging pages 2-3 of the specification, Applicant teaches that "the photocurable resin has disadvantages in that it generally has poor reactivity and cannot be used for a molded product with a complicated shape which cannot be subjected to light. Thus heat curing is desired for obtaining a complicated molded product." The photo-curable composition is cured by using photo energy and may thereby cause partial curing failure and accordingly fail to yield an optically homogenous cured product in the production of a thick cured product or a cured product containing a low-permeability material. In addition, the resulting thick cured product has a woven or burnt surface and is insufficiently cured in a deep part and underexposed portions.

Moreover, as the present application teaches in the second full paragraph on page 3, "a cured product obtained through heat cationic polymerization of the alicyclic epoxy resin has disadvantages in that shrinkage in curing takes places" and "the cured product is hardly used in fields requiring precise adhesion and the like."

The present invention solves the problems of low shrinkage in curing by using a heat-curing composition containing an epoxy compound having a certain polyester chain represented in formula (2) in a molecule. See the paragraph bridging pages 5-7 of the specification. In contrast, bis(3,4-epoxycyclohexylmethyl) adipate disclosed in the Examples of Yamamura does not have a polyester chain represented in formula (2).



Polyester chain represented in Formula (2)

Furthermore, Comparative Examples 3 and 5 of Yamamura show a disadvantage in that a deforming time becomes prolonged when the composition includes a surfactant (silicon-type or fluorine-type). In contrast, the present application teaches in the paragraph bridging pages 13-14 of the specification that the surfactant is a component for adjusting a defoaming property. The effects of the surfactants between the present application and Yamamura are opposite to one another. Therefore, the invention of Yamamura cannot be a motivation to use a surfactant in the heat-curable resin composition of the present invention.

As stated above, Yamamura does not describe the heat-curing and the effect of inhibiting the shrinkage in curing by using an epoxy resin compound having a certain polyester chain. Therefore, it is impossible to find the invention described in independent claim 3 of the present invention disclosure of Yamamura. Withdrawal of the anticipation rejection is in order and is earnestly solicited.

Issues under 35 U.S.C. § 103

On page 5 of the Office Action, claims 3, 7-10, 12, and 14 are rejected as being unpatentable over two combinations of references: US 5,378,736 (Fujiwa) in view of JP 2002-338659 (Takai¹); and EP 0 736 555 A2 (Barbe) in view of Takai. Applicant respectfully traverses the rejections, for reasons explained in detail hereinbelow.

¹ US 2003/0059618 A1 is, erroneously as explained herein, used by the Examiner as an English-language version of the Takai disclosure.

THE TAKAI DISCLOSURE. The Examiner uses US 2003/0059618 A1 for ease of citation of JP 2002-338659. US '618 is an application claiming priority to three Japanese applications – JP 2002-275169, JP 2002-338659, and JP 2003-13001. JP '659 is just one of three priority applications of US '618, so the use of US '618 for ease of citation of JP '659 may be appropriate for some purposes. However, an alleged description that the Examiner cited for an explanation of rejection (i.e., a description on page 13 in the 02/24/2009 Office Action) is not a description of the invention of JP '659 but instead is a description of an invention of application JP 2003-13001. JP '659 discloses a heat-curable resin composition. However, JP 2003-13001 discloses a UV-curable coating composition which includes a cationic polymerization initiator that generates cationic species only by ultraviolet irradiation, not by heat energy. The publication date of JP 2003-13001 is January 15, 2003, which is later than the December 27, 2002 priority date of the present application. Therefore, JP 2003-13001 is not available as a reference against the present application. ***Enclosed herewith is a computer-translated English translation of JP '659, which shows that the disclosure upon which the Examiner relies is not actually found in JP 2002-338659.***

FUJIWA IN VIEW OF JP '659. JP '659 discloses a heat-curable composition, however, Fujiwa discloses a photo-curable composition. Therefore both are significantly different compositions. The photo-curable composition of Fujiwa comprises an alicyclic epoxy compound having ester structures. On the other hand, JP '659 discloses in [0005] that “if an alicyclic epoxy compound having a structure such that an ester linkage is not present therein and methyl group is not present on carbon constituting an alicyclic epoxy is used, an epoxy resin composition for photosemiconductor encapsulation, which provides a cured product having excellent moisture and heat resistance and transparency, can be obtained to thereby overcome the problems”. JP '659 clearly describes the drawback of the epoxy compound having ester linkage. There is, therefore, no motivation or rationale for combining the disclosures of JP '659 and Fujiwa.

The Examiner contended that Fujiwa teaches that the composition of Fujiwa can be coated on a base material and ***cured by photo-curing during heating*** (col. 20, lines 43-47) in the

previous Office Action. The composition of Fujiwa is not heat-cured, because it does not include a heat-cationic polymerizable initiator which generates cationic species by heat. The terminology "photo-curing during heating" means that a curing reaction becomes fast because a cation which is generated by photo-energy can move fast in composition by heating-energy. The terminology "photo-curing during heating" does not mean heat-curing by heat-energy. Therefore the terminology "photo-curing during heating" does not disclose the heat-curable resin composition of claim 3 of the present application.

JP '659 describes in [0024] that "various additives (such as defoamers) can be added to the liquid epoxy resin composition in an amount not adversely affecting viscosity of the liquid epoxy resin composition." There is no concrete description of use of defoamers in JP '659. Hence, persons of ordinary skill in the art would not know what kind of effect would be provided from the use of defoamers. The present invention as recited in claim 3 shows the advantageous effect that shrinkage in curing is improved by using the composition comprising the diepoxide compound having a certain polyester chain represented by formula (2), a cationic polymerization initiator, and a surfactant. A person of ordinary skill in the art would not be able to obtain the advantageous effects of the present application from the combination of JP '659 and Fujiwa.

BARBE IN VIEW OF JP '659. JP '659 discloses a heat-curable composition. However, Barbe discloses a photo-curable composition comprising a photo-curing cationic initiator. Therefore, both of these references are concerned with significantly different compositions. The photo-curable composition of Barbe comprises an alicyclic epoxy compound having ester linkages. JP '659 clearly describes the drawback of the epoxy compound having ester linkage, therefore, it is not proper to combine JP '659 and Barbe. Furthermore, as stated above, JP '659 does not provide a concrete description of use of the defoamers.

Moreover, the photo-curable resin composition of Barbe comprises an epoxy compound having a (meth)acrylic group and a radical polymerization initiator. The polymerization reaction thereof includes a radical polymerization. Barbe teaches that "the epoxy(meth)acrylate resin has disadvantage of rigidity, brittleness and high shrinkage in curing" (lines 19-20 on page 1).

Furthermore, Barbe teaches that "a photo-curable epoxy resin is not adversely affected

by oxygen during the curing process compared to a radical-polymerizable type photo-curable resin, and it is more advantageous in photo-sensitivity and adhesive property than the radical-polymerizable type resin”(lines 26-28 on page 1). Thus a radical-polymerizable type photo-curable resin and a cation-polymerizable type photo-curable resin are quite different – not only in their constituents but also in their properties. Therefore, there is no motivation or rationale for combining the heat-curable resin composition of JP ‘659, which initiates a cationic polymerization, and the photo-curable resin composition of Barbe, which initiates a radical polymerization.

Therefore, a person of ordinary skill in the art would not be able to obtain the advantageous effects of the present application from the combination of JP ‘659 and Barbe.

Contact information

Withdrawal of all rejections of record is in order and is earnestly solicited.

Please contact Richard Gallagher, Registration No. 28,781, at (703) 205-8008 with any questions concerning this application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fee required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: December 4, 2009

Respectfully submitted,

By 

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